DOCUMENT RESUME

ED 445 423 EC 308 027

AUTHOR	Ross-Kidder, Kathleen
TITLE	Gender Differences in Psychometric Profiles of Adults with Learning Disabilities.
PUB DATE	2000-03-30
NOTE	19p.; Paper presented at the Annual Convention of the National Association of School Psychologists (New Orleans, LA, March 30, 2000).
PUB TYPE	Reports - Research (143) -- Tests/Questionnaires (160)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Adults; *Disability Identification; Eligibility; High School Equivalency Programs; Intelligence Differences; *Learning Disabilities; Models; *Screening Tests; *Sex Differences; *Test Validity; Verbal Ability
IDENTIFIERS	*General Educational Development Tests; *Testing Accommodations (Disabilities)

ABSTRACT

This report introduces the General Education Development Testing Services (GEDTS) Administrator screening model for adults with learning disabilities. The screening model is designed to identify adults whose educational achievement is significantly below overall potential due to an informational processing deficit and who are thus eligible for testing accommodations in taking the General Educational Development Tests. To investigate the diagnostic validity of the screening model, a study explored whether the Wechsler profiles of 464 adults with learning disabilities or attention deficit disorders and referred for testing accommodations varied as a function of gender. Results found that women requesting accommodations are older and have lower overall ability in most areas measured using the Wechsler intelligence scales. Women did as well as men when recalling a series of numbers and they know definitions to words at a somewhat closer level to men. They did better than men when copying sign/symbol combinations. Gender differences were also found in comparison of discrepancies among factors and measure of overall ability. Test results also confirm the fact that adults with learning disabilities tend to have lower verbal functioning. Results of the study support the GEDTS screening model. (Contains 26 references.) (CR)

Reproductions supplied by EDRS are the best that can be made
from the original document.

EC

ED 445 423

Gender Differences in Psychometric Profiles of Adults with Learning Disabilities

Presented to the National Association of School Psychologists Annual Convention

New Orleans, Louisiana
March 30, 2000[1]

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Kathleen Ross-Kidder, Ph.D.
Department of Psychology
The George Washington University
Washington, D.C.
Psychological Consultant to GEDTS, Washington, D.C.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Ross-Kidder

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Abstract

The GEDTS Administrator screening model for adults with learning disabilities is introduced. Gender differences and the nature of learning disabilities in adults are reviewed. Implications of definitions of learning disability as related to service provision are considered. Psychometric profiles of over 700 adults with learning disabilities found that women requesting accommodations are older and have lower overall ability in most areas measured using the Wechsler intelligence scales. The GEDTS screening model was supported. Significant VIQ-PIQ differences were found. Bannatyne's factors and the ACID factor were also found to be significantly lower than overall intellectual potential.

Outline for today's presentation:

Introduction	2
GEDTS Screening Model	2
Learning Disability and definition	4
Implication of definition	5
Research Questions	6
Bifurcated research and adults with learning disability	7
Outcome findings for adults with LD	8
Gender Issues: Right to work and welfare legislation	8
Summary & research questions	9
Method	9
Procedure	9
Results	10
Discussion	11
References	14
Figure 1: The GED Screening Model	16
Table 1: Mean Wechsler scores	17
Table 2: Differences between FSIQ and factors	17
Table 3: Differences between PIQ and factors	17
Table 4: Gender Differences/Wechlser Scores	18
Table 5: Gender differences in factor comparisons	18

[1] Special thanks to Wai-Ying Chow for organization of data input and editing assistance on this project.

EC 308027

BEST COPY AVAILABLE

Gender Differences in Psychometric Profiles of Adults with Learning Disabilities

Introduction:

Psycho/educational assessment is central to diagnosis of learning disability in children and adults. Assessment is essential to special education program determination for children and adolescents under guidelines provided by the Individuals with Disability in Education Act (IDEA), entitlement legislation originally passed by Congress in 1975, guaranteeing educational services.

Assessment is also essential to documentation of disability for adults with learning disabilities requesting accommodations; e.g., extended time when taking tests in post secondary settings; i.e., universities, employment and gateway tests such as the SAT and GED. Accommodations are guaranteed under federal mandate of civil rights legislation; i.e., The Americans with Disability Act (ADA) passed in 1990 and Section 504 of the Vocational Rehabilitation Act (1973).

Recent litigated court decisions, *Bartlett vs. State of New York* and *Gluckenberger v.* Boston University confirm psycho/educational assessment's role. Litigation also stipulates agency need for clear, consistent policy.

GEDTS' administrator screening model

What is the GED?

The General Education Development Testing Service (GEDTS) has been especially instrumental in developing policy which meets federal guidelines. The GED is a gateway nontraditional high school diploma for adults who did not complete high school. The GED 5 test-battery requires 7 hours and thirty-five minutes. Tested academic areas tested are: Writing Skills, Social Studies, Interpreting Literature and the Arts, and Mathematics. The General Educational Development (GED) Tests reflect core educational content of K-12 programs of study. About one in seven high school diplomas issued each year is a GED.

Over 45 million U.S. adults do not have a high diploma. In 1998, 822,181 adults attempted the GED. 70.9% passed. This pass rate is consistent with GEDTS norming. 67% of current high school seniors in the GEDTS norming sample passed. In 1997, 68% reported taking the GED for further education and training. Only 27% reported taking the test for employment purposes.

GEDTS' position is unique! It is a secondary degree given to adults. In general, laws applying to adults determine policy. Postsecondary education policy sets precedent. Nightengale et al (1991) suggest that 50% of those who have not completed high school have a learning disability. If Nightengale is correct, 400,000 adults taking the GED in 1998 may have had a learning disability and/or ADHD. For many, the disability was undiagnosed.

Most agencies would expect a rate of identified disability between 2-5%. A potential request rate of 50% is a large challenge.

Many who apply for accommodations when taking the GED anticipate the same accommodations they had when in public school, i.e., under IDEA. Unlike IDEA, ADA

is not entitlement legislation. ADA and 504 protect adults who meet legal definitions of disability.

Those not previously identified often do not understand why more than a statement of school failure is needed to obtain "help," in the form of accommodations, when taking the GED. Both 504 and ADA impose requirements of documentation. Assessment by qualified professionals is also required. Licensed school psychologists can anticipate an expanding role as more adults seek documentation of learning disability.

For those without a high school diploma, income is often low. GEDTS has a responsibility to ensure cost for taking the GED remains low. Unlike programs mentored under IDEA, GED receives no additional funding to provide accommodations. The cost to provide a scribe or someone to supervise individually the over seven hour administration of the GED in a private room exceeds the cost the candidate pays to take the test. GEDTS does not impose additional costs for accommodated testing.

GEDTS must also maintain a high standard that guarantees to employers and institutions of postsecondary education that core subject content of the high school curriculum is learned. Within guidelines of ADA, for educational institutions, Heyward (1999) and Vess (2000) state "there must be an individual determination by the institution that a particular student has met admission or other standards determined by the school."(Vess,2000,p. 18) The GED pass rate of 67% of current high school seniors is equivalent to the expectations of normal, to above average, intellectual potential. Some who apply to take the GED do not meet this expectation.

GEDTS also must educate and train. Many in the field of adult education know little about learning disabilities or about the needs of adults with learning disabilities and/or ADHD.

Thus, the GED is a secondary degree for which postsecondary educational policy sets precedent since GED candidates are adults. GEDTS anticipates as many of 50% may request accommodations. It must budget for this and it must keep costs low. To assure that candidates obtain accommodations it must also educate. And to validate the direction of its course GDTS must investigate scientifically outcome so that others find a clearer path! In 1998, all of GED administrators were educated, policy was defined and research initiated. GEDTS policy widens horizons for adults with LD and/or ADHD!

What is the GED Administrator LD screening model?

To meet federal mandates, to assure the needs of adults with learning disabilities are met, and to train administrators, GEDTS developed a model and screening procedure that could be used by state GED administrators to approve requests for accommodation in a consistent and timely manner. This model evolved from limited existing research about the nature of learning disabilities in adults, existing studies on diagnosis and assessment in children, and common preferred practices of state public education models within the United States, its territories, and Canada.

The model received extensive review by experts in assessment and by advocacy groups who work with adults with disability. The U.S. Department of Education and Justice also reviewed the GED model. As GED State administrators trained on the

model, they provided additional input. Such extensive efforts establish an effective method of increasing nationwide outreach and accommodations for adults with learning disabilities. To date only pilot data suggests this model is moving in the right direction (Ross-Kidder, Edwards, & Freedman, 1998). Further testing of the model's hypotheses is needed to determine if the underlying assumptions of the screening model are valid for adult populations with learning disabilities.

The GED Administrator LD screening model is presented in Figures 1 and 2. The model follows the U.S. Department of Education's definition of learning disability while adhering to the constraints of federal legislation, i.e., IDEA, ADA, and Section 504 of the Vocational Rehabilitation Act.

A critical question for this model is whether this model does in fact identify discrepancies so that a screening model becomes valid. The model is based on a definition of normal intelligence (IQ 70 or above) and information processing dysfunction (as identified by the VIQ-PIQ difference or by significant differences in factor scores as identified by Bannatyne (1967) and Rugel's ACID factor. Bannatyne's factor scores are combinations of the Wechsler subtest scores as follows: Verbal Conceptualization (mean of Vocabulary, Similarities, Comprehension); Perceptual Organization (mean of Picture Completion, Block Design, Object Assembly); Sequential Processing (mean of Digit Span, Arithmetic, Digit Symbol/Coding); and Acquired Knowledge (mean of Information, Vocabulary, and Arithmetic). The ACID factor is the mean of Arithmetic, Coding/Digit Symbol, Information, Digit Span.

Federal law mandates that a disability must currently significantly, negatively impact a major life activity. Thus with identified information processing deficits, the model also needs to determine that educational achievement is significantly below overall potential and that this is due to the information processing deficit and not to emotional or cultural factors. This is determined by significant standard score discrepancies between potential and current achievement.

Learning disability and definition

This GEDTS model evolves from the U.S. Department of Education's definition of a learning disability. Application of definition is critical to policy formulation and research focus. Learning disabilities are a heterogeneous group of syndromes that are known to exist across the lifespan (Reiff, 1990). Specific definition application, however, often is different for the adult. Diagnosis during childhood is under guidelines of federal entitlement mandates of IDEA. This assumes definition relevant to educational objectives. While criteria of diagnosis and inclusion may not be consistent across states, most public school systems base definition of learning disability on that given by the United States Department of Education. This definition states that a learning disability is:

> *The term "specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning disabilities which are primarily the result of*

> *visual, hearing, or motor handicaps, or mental retardation, or emotional disturbance, or environmental, cultural, or economic disadvantage. (U.S. Office of Education, 1977)*

Once students achieve adult status, however, different federal regulations apply. Based on the civil rights mandates of ADA and Section 504, individuals cannot be discriminated against based on disability; i.e., you cannot be denied a job for which you are otherwise qualified if you have a learning disability. The employer does not have to determine if this disability exists and remediate. The employer must accommodate when an employee self-identifies and presents documentation of the disability that is derived from well normed, valid and reliable pscyhometric instruments administered by those with advanced training in the understanding of learning disabilities among adults. Accommodations are provided to "level a playing field" when clear documentation within federally mandated guidelines is provided and when that documentation clearly specifies how the accommodation requested is relevant to the disability. For example, if an adult has an identified reading disability a psychologist cannot routinely request an accommodation of a private room during testing unless it is made clear how lack of a private room impacts upon the individual with disability in such a way that it significantly, negatively impacts one of life's major activities. Furthermore, at the heart of the ADA and 504 definitions is the ruling that a person's impairment result in significant disability below that of population norms; i.e., that a person with an IQ of 140, an information processing deficit in visual motor encoding that results in relatively significantly low reading achievement with a standard reading score of 100 would not be defined as a person with a disability (Gordon & Keiser, 1998).

There are many agencies serving the needs of adults with learning disability, thus, many definitions specific to service provision. A commonly used definition is that of Rehabilitation Services Administration; i.e.,

> *A specific learning disability is a disorder in one or more of the central nervous system processes involved in perceiving, understanding, and/or using concepts through verbal (spoken or written) language or nonverbal means. This disorder manifests itself with a deficit in one or more of the following areas: attention, reasoning, processing, memory, communication, reading, writing, spelling, calculation, coordination, social competence, and emotional maturity. (Rehabilitative Services Administration, 1985)*

It can be noted that this definition broadens the range of those who may be considered learning disabled. Lower ability ranges are not excluded within this definition. Emotional and cultural factors also are not excluded.

Implication of definition

Kavale & Forness (1998) address the implication of definition as it relates to advocacy and research. They question the efficacy of advocacy where limited research basis exists. The lack of research is most pronounced when learning disabilities and adults are considered. This is especially true for adults who did not successfully complete high school.

Evidence suggests that students with learning disabilities generally fall academically within the bottom third of their class. Research also indicates that those in the lower third of their class are significantly more likely to leave school before graduation. In 1997 over 44 million adults in the United States did not have a high school diploma (GEDTS, 1998). Nightengale (1991) suggests that over half of those students who

leave school before graduation have a learning disability. In spite of this less than one percent of adults request accommodations or submit documentation of learning disability when taking the GED.

Several factors may explain an accommodation referral rate of less than one percent: (1) Adults with learning disabilities have had a long history of school failure and they may avoid situations that bring those issues forward. They do not request accommodations because they are less likely to expect to succeed in tests that require academic abilities; (2) Many who work with adults do not understand learning disabilities; (3) There has been little outreach to make adults aware of rights and the possibility of disability under the guidelines of federal legislation; (4) Resources for needed assessment and documentation are limited; i.e., those most impacted by the disability are also the most likely to be in lower socio-economic group due to their limited employment potential and are less least likely to be able to afford diagnosis; (5) Agencies, such as Vocational Rehabilitation programs, often fund assessment based on degree of severity of the disability. Learning disability is not seen as disabling as more "visible" disabilities. Unless an advocate strongly argues on behalf of an adult with a learning disability linking assessment to employment, assessment is often unavailable to those with learning disability; (6) Those most directly involved in provision of services to those with learning disability focus on children. School psychologists understand the nature of learning disabilities but they often do not assess adults. Clinical psychologists often are not trained in the nature of learning disabilities and their assessment, yet they most often fulfill the role of adult diagnosis; and (7) there is a paucity of research clarifying the impact and nature of learning disabilities in adults.

Research Questions

Also critical to services for adults is greater clarity of the nature and impact of this life-long disability across the lifespan. An often documented issue in children's' studies is that of gender. Most research studies indicate that males are more likely to be referred and subsequently diagnosed (McCue, Shelly, & Goldstein, 1986; Michaels, Lazar & Risucci, 1997.)

Reasons for this disparity have been linked(1) to genetic factors and vulnerability of the male fetus; (2)male classroom behaviors that are often more problematic and aggressive resulting in more likely teacher referral; (3) tenacity of parents, especially those with white middle to upper class boys who are underachieving academically, in seeking additional school services; and (4) assumptions that this is primarily a male disorder and the resulting inherent limitations on reviewing female academic dysfunction under the same criteria.

While attention has been given to gender disparity in referral and program inclusion rates, little attention has been paid to psychometric profile of individuals diagnosed with specific learning disabilities as a function of gender. The question is especially relevant to adult populations with learning disabilities. Gerber & Reiff (1994) state those adults with learning disabilities show a wide range of symptoms that cause problems for them in daily life. Academic skills not learned in school continue to limit. Long school history of academic distress results in many secondary characteristics. Adults with learning disabilities, like children, also have overall feelings of lack self-worth and self-esteem (Barton & Fuhrmann, 1994).

Bifurcated research and adults with learning disabilities.

The scant body of psychometric adult LD research bifurcates into two primary areas of investigation: college students receiving services (Cordini, et al, 1981; Vogel, 1986); and adults requesting vocational rehabilitation services. These may represent two very diverse populations, or homogeneous groups (Minskoff et al, 1988).

The college group seems to have compensated for the disability with relatively positive outcome. Henderson (1995) reported that 32% of full-time college students in 1994 reported having a disability. The largest proportional increase since 1985 of students with disability on college campuses has been the increase in the number of students requesting services due to learning disability (Levine & Nourse, 1998).

On the other hand, those requesting services for vocational rehabilitation have not been able to adjust as successfully. In vocational rehabilitation settings adults with learning disabilities often find it difficult to obtain needed services, since this "invisible" disability is not seen as severe as other more visible syndromes.

In recent years, with the impact of the American with Disabilities Act (ADA), employers are beginning to learn more about the needs of adults with learning disability. Federal law mandates that accommodations be provided for otherwise qualified individuals with documented disabilities when the disability significantly negatively impact upon one of life's major activities such as employment or education.

Little is known about adults with learning disabilities who do not come to the attention of special programs. Many remain underemployed or undereducated. Many, because of a very difficult experience within public education, will never seek necessary tools for advancement. The underlying gatekeeper will be the learning disability.

Some will seek equivalency diplomas, GEDs. Higher education or better employment is often the goal.

Outcome findings

Current knowledge of educational and employment outcomes for adults with learning disabilities is limited. Levine & Nourse (1998) reviewed data from 13 frequently referenced follow-up studies of post-secondary outcomes of youth with learning disabilities that attended special education programs. Findings were an overall employment rate of 60% (Blackorby & Wagner, 1996) and low college attendance (Affleck, Edgar, Levine & Kettering, 1990). An especially troubling finding was that women who have been in special education programs for learning disabilities did significantly less well than men after leaving high school (Wagner, 1992).

In the first year following high school 37% of men and 26% of women with learning disabilities entered postsecondary education. This is compared to 79% of men and 71% of women with no disabilities. College attendance, however, is usually tied to socio-economic status. This, in part, may explain the significant difference in rate of college attendance.

When employment rates following high school are considered, however, men with learning disabilities find greater success. Stilltington and Frank (1990) did a follow-up study of post school status of 911 graduates with learning disability in the state of Iowa. More men with learning disabilities were employed at a higher rate than women (81% vs. 66%) and men earner higher wages. Blackorby and Wagner (1996) found that at two years post graduation, men with disabilities were more likely to be employed than women, with a significantly higher increase 3 to 5 years after school. This trend was the reverse of that for the general, non-learning disabled population. For those without identified learning disability, employment rates for women were found to be increasingly higher than for men.

Such findings raise several important questions. Women with learning disabilities attend college at a rate comparable to that of men. Women with learning disabilities who do not attend college seem to be at greater disadvantage than men. This may suggest that women with learning disabilities may have a significantly different psychometric profile that more substantially limits employment success. Since they attend college at a level commensurate with men this hypothesis does not seem likely. Another possibility is that women are more likely than men to not enter the employment force due to marriage or motherhood. Levine & Edgar (1995), for example, found that 37% of female 1985 high school graduates with learning disabilities were either not attending school or unemployed. Of this group 90% were parenting children.

Comparative data looks only at follow-up studies of those students who have completed high school. Data does not provide outcome comparisons for men and women with identified, or non-identified learning disabilities, who do not complete high school. Among the general population, lack of a high school diploma significantly negatively impacts earning potential.

Issue of right to work and welfare legislation

Issues of outcome are becoming more salient as Congress imposes changes in welfare legislation requiring that all who are able return to the workforce. Since men are often employed at a greater rate than women and with higher income, it seems likely that policy decisions must look directly at implications for unemployed women. Studies suggest that women are less likely to be identified with a learning disability yet women are more likely to be unemployed or underemployed. A very relevant question is whether women are not being diagnosed or if their patterns of disability are different from that of males. Young (2000) suggests that little attention to date has been given to the fact that many of the women who are currently receiving welfare services have learning disabilities.

One way to begin to unravel this question is to compare psychometric profiles of those adults with documented learning disabilities to determine if gender differences exist. The focus of the remainder of this presentation is analysis of data gathered from the GED Testing service of over 700 candidates requesting accommodations due to learning disabilities.

Another relevant issue for discussion is to determine if the model established by the GED for screening purposes meets that function. The current presentation also outlines the GED screening model and reports on data analysis looking at the application of this model.

Summary:

The current study considers whether the Wechsler profiles of adults referred for testing accommodations varies as a function of gender. Previous studies indicate higher male inclusion but lower female ability. There are no previous studies comparing Wechsler adult profiles, including index and factor scores, of adults with learning disabilities. Such information, however, is critical to future planning for services and relevant to determining of diagnostic validity of the GED screening model.

Method

Subjects:

Documentation of 745 individuals diagnosed with learning disabilities and/or ADHD requesting test accommodations when taking the GED, a nationally normed gateway high school equivalency test for those who have not completed high school, were reviewed. 38%, 281 subjects, were dropped from data analysis because their requests did not contain sufficient information to make diagnosis of a learning disability. Testing either of intellectual functioning or academic achievement was missing. Others were not included because gender was not identified or because overall ability fell below a cut-off score of an intelligence quotient of 70 or higher. The original sample had 494 identified male subjects and 205 females. 464 profiles were identified as documented learning disabilities and included in subsequent data analysis. Of this population, there were 333 males and 131 females. Subject ages ranged from 15-60 with mean age of 23.66 (SD=9.37).

Apparatus:

Wechsler Intelligence Scale (Wechsler Adult Intelligence Scales -Revised and III, WAIS-R & WAIS-III); Wechsler Intelligence Scales for Children-III (WISC-III)) scores and standard achievement test scores derived from the Woodcock-Johnson Achievement Battery or other relevant well standardized test of academic achievement were recorded on GEDTS Form L-15, the form requesting accommodations due to learning disabilities and/or ADHD. Individual subtest scores, certification or licensure of examiner, disability categories and requested accommodations were also recorded.

Procedure:

All data was obtained from candidate requests for accommodations when taking the GED. All candidates, or their advocates, completed Form L-15 by transferring needed information from psychological and educational reports used to identify the nature of the learning disability. Educational testing was current within the past three years. Psychological testing was evident of adult cognitive functioning; i.e., administered while the candidate was either an adolescent or adult. If those criteria were met, no limit was put on how old the psychological report might be. License or certification of those making diagnosis was also recorded.

Using completed Forms L-15, information was taken and recorded by two undergraduate psychology students who were hired to encode data. The students were not aware of the intended nature of data analysis.

Data was gathered from requests submitted during 1997-1998. In 1997, GEDTS began making state GED administrators aware of the needs of adults with learning disability and the need to make certain accommodations were provided. In late 1998-1999 GEDTS extensively trained all GED state, territorial and provincial administrators how to screen for learning disabilities so that more accommodations could be provided. This was a three-day training session with a certification exam. Following the administrator training requests for accommodation were most often approved at the state level.

Results

Univariate data analysis was used to generate Wechlser IQ and subtest means. Since the question was one of gender differences, or a comparison of two means, bi-variate, two-tailed t-test comparisons were used for gender data analysis. Initial analysis compared information as provided on Form L-15; i.e., Full Scale Intelligence Quotient (FSIQ); Verbal IQ(VIQ) Performance IQ (PIQ) and individual subtest scores. A second level of data analysis computed factor scores using the Bannatyne and ACID formulas. A comparison of the means formula was used. While it was anticipated that WAIS-III and WISC-III Index scores would also be informative, less the 10% of documentation provided these scores. There were only five subjects with WAIS-III scores thus that section of analysis was dropped.

Comparison of overall population differences as a function of GED model.

Univariate:

Mean population FSIQ was 88.69 (SD=10.03) with a mean VIQ of 87.59 (SD 10.55) and a PIQ of 92.14 (SD=11.59). FSIQ ranged from 70-131; VIQ, from 70- 128 and PIQ from 70-139. Mean IQ scores and Wechsler individual subtest scores are presented in Table 1.

Bivariate:

Overall population differences between VIQ and PIQ were compared and found to be significant (t=-8.22 p.>001). Factor scores were converted to IQ equivalent scores by multiplying the mean factor score by 10. Since factor and IQ scores would be expected to be correlated, difference scores were created. Differences were then compared between FSIQ and each of the factor scores using a paired comparison of means procedure. Significant differences for all factors except Bannatyne's Perceptual Organization factor and FSIQ were found. Mean difference scores and comparison probability scores are presented in Table 2. There is a difference of 15 points or more on the sequential, acquired knowledge, and ACID factors. Mean

differences were greater when PIQ was used for comparison with the Bannatyne and ACID factors rather than FSIQ. The comparisons are presented in Table 3.

Comparison of Bannatyne factor scores also confirms to Bannatyne's predictions for dyslexic students of Spatial > Verbal> Sequential. Current Bannatyne factor means are: Perceptual Organization 91.2; Verbal conceptualization, 83.1; and Sequential 73.6.

Analysis of gender differences

Bivariate:

Women in the current sample were significantly older. Mean age for women was 26.15 years and for men 22.46 (t=-4.44 p.>001.)

Significant gender differences were found for all Wechlser IQ's. Women were found to have significantly lower ability in most areas measured. When the ACID factor and the Bannatyne Sequential factor are compared, no significant gender effect is found. Women do as well as men when recalling a series of numbers and they know definitions to words at a somewhat closer level to men. They do better then men when copying sign/symbol combinations as required on the Wechsler Digit Symbol subtest. Results are presented in Table 4.

Gender differences were also found in comparison of discrepancies among factors and measure of overall ability. These are summarized in Table 5. Women have significantly greater discrepancy when perceptual organization and acquired knowledge are compared to FSIQ. Males have significantly greater discrepancy when sequential abilities are compared to overall ability (t 2.8 p.>005). No significant gender differences were found in comparison of VIQ-PIQ and FSIQ-ACID.

When PIQ, the higher of the overall Wechsler IQ's, factor discrepancy scores are compared for gender effects similar results are found.

Discussion:

Significant differences between overall ability and the Bannatyne and ACID factors were found. These findings are especially compelling because they indicate that the GED Administrator screening model is an appropriate tool. 38% of the current sample did not have sufficient documentation. This raised concern that advocates do not understand that documentation is necessary to LD diagnosis under federal mandated guidelines.

The cases included in the sample were obtained before the GEDTS began extensive training and outreach to assure that the needs of adults with learning disabilities are met. The robust effect of the significant differences found is therefore somewhat surprising since purity of diagnostic category could not be guaranteed. Current data was not broken down into disability categories. It is possible that those with a reading disorder, for example, may present a different pattern of significant discrepancies that those with a writing or memory disorder.

Test results also confirm the fact that adults with learning disabilities tend to have lower verbal functioning. This may result from the nature of the disability; the lack

of information learned while in school; or from the interactive nature of both the disability and lack of education. The lowest mean Wechsler subtest scores were found on the Information and Arithmetic subtests. These tests may be more sensitive to what has been learned in school.

The pattern of the significant differences between both the FSIQ and the PIQ also reassures that the GED model moves in the right direction. Although statistical properties suggest that a difference of 15 points is necessary between the VIQ and PIQ, GEDTS used a more inclusionary point difference of 8. The current population's score indicates a significant group difference with only 4.55 point difference. While some might be compelled to say then that the 8-point difference is too large, it is important to understand that the current model is a screening model.

Additionally, the current population, though referred for accommodations due to learning disabilities was not limited due to lack of meeting diagnostic criteria as established by the U.S. Department of Education's definition. It seems quite probable that many within the sample would not meet diagnostic criteria if presented to a screening panel or local school eligibility committee. With a diagnostically screened sample differences would be expected to be greater.

Mean IQ's and subtest scores of the current population also parallel scores found by other studies assessing the psychometric profiles of adults within Vocational Rehabilitation Programs (Minskoff et al, 1986). The range of IQ's, however, is quite broad with FSIQ (70 to 131). Subsequent analysis needs to investigate whether patterns of discrepancy differences vary as a function of overall ability measure. The current population may contain two or more very different patterns of scores.

Current data also supports the previous finding of Bannatyne's spatial> verbal> sequential and the importance of the ACID factor in the identification of individuals with learning disabilities. While this model empirically does not look at individual differences that may be described in a comprehensive psycho/educational assessment administered by a professional licensed or certified to make a diagnosis of learning disability, the factors would appear to be an important screening tool.

Gender differences in the sample were not unexpected. Indications are that women in the referral population with learning disabilities are less likely to achieve in school or work following graduation from high school (Levine & Nourse, 1998). The difference in age between men and women was anticipated. Women who do not go on to university or employment are more likely to stay home to raise a family. When the children enter school mothers may return to complete their education. At that time a high school diploma becomes more critical.

The overall level of lower ability level found for women was of some surprise, though it is consistent with earlier findings of "system identified LD females (Vogel, 1990). Wechsler tests are normed so that differences in ability due to gender should not be expected. The significant differences found suggest several possibilities: (1) Girls often were not challenged as much as men in school. This lack of learning may have affected the current results. It might disappear if the females were closer in age to the men of the sample.; (2) Referrals for learning disability special education placements in public school consistently find a higher referral and placement rate for males. This may happen because males often externalize symptoms and thus more often disrupt class. Girls, on the other hand are more likely to internalize symptoms, to figure there is something wrong with them, and to try harder. This means even if

they have a disability it is less likely to be noticed in school. Many will not be diagnosed and many will succeed in spite of the learning disability. When a woman is not successful academically it is more likely to be concluded that she has limited overall ability. Many, even today, define this as a learning disability. Thus, women with low ability may be more likely to be referred for "help" than men. (3) It is likely that the men in the study had previously been identified in school and thus met established criteria of average to above average intelligence. Having received services while in school men are more likely to seek accommodations when tested. It may be less likely for a male to self-identify in order to seek diagnosis as an adult.

This does not mean psychologists and educators should not take note of this very significant difference. It may be very relative to teaching styles, learning expectations and needed accommodations. Women did not differ as significantly from men on the Similarities subtest, a test thought to look more at one's ability to abstract the relationship between concepts. This may mean that women, because of the length of time they have been out of school when compared to men who are returning to take the GED, may need more time to focus on learning basic facts. Once those concrete facts are acquired women may be equally as successful. For example, in career planning women may need to spend more time learning basic math operations as they career plan or learn more basic facts of information. Another possibility is that women have been socialized to believe that their role is one of less learning; i.e., less than their male counterparts. In an academically female world women might be more competitive in their drive to learn. The current data does not compare the current academic achievement of men and women. It is important to know if women with learning disabilities achieve academically at a different level than men.

The lack of a significant gender difference on factors thought to measure attention; i.e., the sequential and ACID factors, combined with the significant differences between these factor scores and overall ability, may represent a significant common co-existing co-morbidity of LD and Attention-deficit Hyperactivity Disorder (ADHD) in adults. Future data analysis should seek to determine whether adults referred for accommodations due to learning disability are also diagnosed with a deficit in attention.

While the current data provides support for the GED screening model, it does not offer much guidance for understanding what accommodations may benefit an individual; i.e., does particular pattern of subtest or factor scores indicate a specific disability that, when accommodated in a specific manner, results in greater likelihood of passing the GED or of obtaining success in employment. It would also be important to determine if profiles differ as a function of diagnosed disability; i.e., is the profile of an ADHD request different from that of a student who has a learning disability? Do individuals with higher overall ability demonstrate different profiles from those with lower ability? Can the GED model better predict outcome so that classroom strategies can better meet individual needs?

References

Affleck, J., Edgar, E., Levine, P., & Kortering, L. (1990). Postschool status of students classified as mildly mentally retarded, learning disabled, nonhandicapped: Does it get any better with time? *Education and Training in Mental Retardation, 25,* 315-324.

American with Disabilities Act of 1990, 42 U.S.C.A.§§§§ 12101 et seq. (West, 1993).

Bannatyne, A. (1967) Diagnosis: A note on recatergorization of WISC scaled scores. *Journal of Learning Disabilities, 7,* 272-274.

Bartlett v State of New York (1998) United States Court of Appeals for the Second Circuit, 156F.3d321;U.S. App. LEXIS; 8 A. Disabilities Cas. (BNA) 1004.

Blackorby, J. & Wagner, M. (1996) longitudinal postschool outcomes of youth with disabilities. Findings from the National Longitudinal Transition Study. *Exceptional Children, 62,* 399-413.

Cordini, B.K, O'Donnell, J.P. Ramaniah, N.V., Kurtz, J., & Rosenshein, K. (1981) Wechsler adult intelligence score patterns for learning disabled young adults. *Journal of Learning Disabilities, 14,* 404-407.

GEDTS, (1998) *Who took the GED?* American Council on Education (ACE): Washington, D.C.

Gerber, P.J. & Reiff, H.B. (1994) *Learning disabilities in adulthood: Persisting problems and evolving issues. Austin, TX: PRO-ED.*

Gordon, M. & Keiser, S. (1998). *Accommodations in Higher Education under the American with Disabilities Act (ADA): A No-Nonsense Guide for Clinicians, Educators, Administrators and Lawyers.* GSI publications: DeWitt, N.Y.

Heyward, S. (1999). Disability and Higher Education: Guidance for Section 504 and ADA compliance. Horsham, PA: LRP Publications.

Individuals with Disabilities Educational Act of 1990, Public Law 101-474, 104 Stat. 1142 (1990).

Kavale, K. & Forness, S. (1998). The politics of learning disabilities. *Learning Disabilities Quarterly, 21,* 245-273.

Levine, P & Edgar, E. (1998). An analysis by gender of long-term postschool outcome. *Exceptional Children, 61,*282-302.

Levine, P. & Nourse, S. (1998). What follow-up studies say about postschool life for young men and women with learning disabilities: A critical look at the literature. *Journal of Learning Disabilities, 33(3),* 212-233.

McCue, P., Shelly, S., & Goldstein, G. (1986). Intellectual, academic, and neuropshychological performance levels in learning disabled adults. *Journal of Learning Disabilities, 19,* 223-236.

Michaels, C., Lazar, W., & Risucci, D. (1997). A neuropsychological approach to the assessment of adults with learning disabilities in vocational rehabilitation. *Journal of Learning Disabilities, 30,* 544-551.

Minskoff, E., Hawks, R., Steidle, E. & Hoffman, J. (1986). A homogeneous group of persons with learning disabilities: Adults with severe learning disabilities in vocational rehabilitation. *Journal of Learning Disabilities, 22,*521-528.

Nightengale, D. et al. (1991). The learning disabled in employment and training programs. Research evaluation series 91-E ED339715.

Rehabilitation Act of 1973, Public Law 93-112,87 Stat. 335 (1973).

Ross-Kidder, K., Edwards, F., & Freedman, B. (1997) Pilot WAIS-R GEDTS data. Paper presented to the International Learning Disabilities Association, Atlanta, GA.

Rugel, R.(1967) WISC subtest scores of disabled readers: A review with respect to Bannatyne's recategorization. *Journal of Leaning Disabilities, 7,* 57-64.

Stilltington, P.L. & Frank, A.R.(1990). Are adolescents with learning disabilities successfully crossing the bridge into adult life? *Learning Disability Quarterly, 13,* 97-111.

Vess, S. (2000) Transitioning to postsecondary education: New opportunities and lost protections. *Communique, National Association of School Psychologists,* 28, *5,* 18-19.

Vogel, S. (1990). Gender differences in intelligence, language, visual-motor abilities, and academic achievement in students with learning disabilities: A review of the literature. *Journal of Learning Disabilities, 23,* 44-52.

Wagner, M. (1992). Being female---A second disability? Gender differences in the transition experiences of young people with disabilities. Menlo Park, CA: SRI International.

Young, G. (2000) Presentation at the International Learning Disabilities Association in Reno, Nevada, February 18, 2000.

Figure 1: GED Administrators' LD SCREENING MODEL

Information Processing

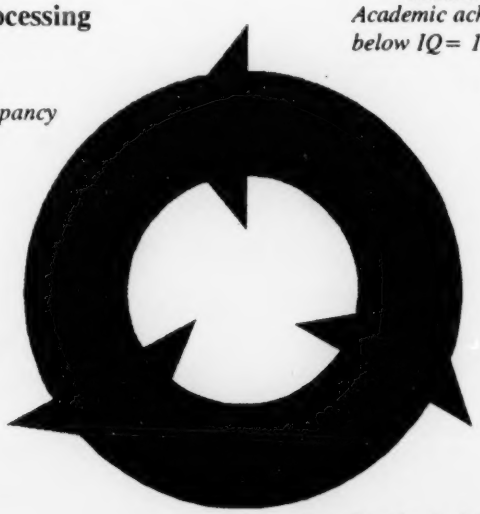
VIQ-PIQ= 8 or more
Significant factor discrepancy

- *Bannatyne*
- *ACID*

Intellectual Potential

Academic achievement significantly below IQ= 15 points or more?

IQ= 70 or above?



Academic Achievement

Academic achievement significantly below IQ=15 points or more.

Screening Model Documentation: Disability Law X Definition

	Potential	Disability	Significant Negative Impact	Documented
Average to Above Intelligence	Wechsler IQ above 70			Wechsler Intelligence Scales
Information Processing Dysfunction		Significant difference between VIQ & PIQ Difference in Bannatyne or Acid Factors		Wechsler subtest scores (factors) VIQ-PIQ= 8 or + Supporting documentation; e.g., Bender, TOWL, TONI, etc
Significant Negative Impact on Academic Achievement			Significant discrepancy in one or more areas of academic achievement due to processing dysfunction.	WAIS-III WISC-III minus WJ-R achievement standard scores.
Not due to emotional or cultural factors				1 .Information processing deficits 2. Academic achievement deficits

Table 1: Mean Wechsler Scores

Measure	standard score
Full Scale Intelligence Quotient (FSIQ)	88.69
Verbal IQ (VIQ)	87.59
Performance IQ (PIQ)	92.14
Information (In)	7.17
Vocabulary (Vo)	7.59
Comprehension (Com)	8.38
Similarities (Sim)	8.52
Digit Span (DS)	7.66
Arithmetic (AR)	6.80
Picture Completion (PC)	9.20
Block Design (BD)	8.48
Picture Arrangment (PA)	8.98
Object Assembly (OA)	8.78
Digit Symbol (DSM)	7.68

Table 2: Differences between FSIQ and factors

Variable	N	Mean	Std Error	T	Prob>T
VIQ-PIQ	466	-4.55	.553	-8.22	.0001
FSIQ-VC	413	6.99	.826	8.46	.0001
FSIQ-PO	411	.22	.861	.25	.7960
FSIQ-SEQ	411	14.706	.733	20.04	.0001
FSIQ-AK	414	16.592	.652	25.44	.0001
FSIQ-ACID	414	15.12	.553	27.34	.0001

Table 3: Differences between PIQ and factors

Variable	N	Mean	Std Error	T	Prob>T
PIQ-VC	413	10.19	1.05	9.67	.0001
PIQ-PO	413	3.42	.73	4.65	.0001
PIQ-SEQ	411	17.84	.82	21.74	.0001
PIQ-AK	414	19.78	.88	22.27	.0001
PIQ-ACID	414	18.32	.72	25.41	.0001

Table 4: Gender Differences in Wechsler Intelligence Scores

	Male	Female	T	prob>T
FSIQ	89.64	86.32	3.4	.007
VIQ	88.42	85.21	2.95	.003
PIQ	93.06	89.94	2.63	.007
VC	8.31	7.77	2.23	.02
PO	9.12	8.15	4.03	.001
SEQ	7.36	7.44	-.47	.635
AK	7.37	6.75	3.06	.002
ACID	7.38	7.24	.89	.37
IN	7.49	6.34	4.82	.0001
VO	7.73	7.30	1.83	.0675
SIM	8.65	8.08	2.17	.0305
AR	7.02	6.19	4.05	.0001
COM	8.60	7.86	2.46	.0145
DS	7.67	7.55	.57	.5684
PC	9.56	8.44	4.07	.0001
BD	8.76	7.92	2.95	.0034
PA	9.29	8.21	4.23	.0001
OA	9.08	8.43	2.11	.0354
Dsym	7.40	8.31	-3.43	.0007

Table 5: Gender differences in factor comparisons

Comparison	male	female
VIQ-PIQ	-4.64	-4.48
FSIQ-VC	6.36	8.59
FSIQ-PO	-1.71	4.79***
FSIQ-SEQ	15.94	11.71**
FSIQ-AK	15.77	18.67**
VIQ-ACID	15.69	13.74
PIQ-VC	9.5	12.08
PIQ-PO	1.41	8.27****
PIQ-SEQ	19.01	15.14**
PIQ-AK	18.91	22.11
PIQ-ACID	18.82	17.18

P. >.01**
P. >.001***
P. >.0001****